

PCT COOPERATION TREATY

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bähling-Kinne et al.
Bavariaring 4
D-80336 München
ALLEMAGNE

NOTIFICATION OF RECEIPT OF
RECORD COPY

(PCT Rule 24.2(a))

| | |
|---|---|
| Date of mailing (day/month/year) 27 July 1999 (27.07.99) | IMPORTANT NOTIFICATION |
| Applicant's or agent's file reference WO 23919 | International application No. PCT/EP99/03516 |

The applicant is hereby notified that the International Bureau has received the record copy of the international application as detailed below.

Name(s) of the applicant(s) and State(s) for which they are applicants:

NOKIA TELECOMMUNICATIONS OY (for all designated States except US)
KOISTINEN, Tommi (for US)

International filing date : 21 May 1999 (21.05.99)

Priority date(s) claimed :

Date of receipt of the record copy
by the International Bureau : 06 July 1999 (06.07.99)

List of designated Offices :

AP : GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

National : AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX,
NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW

ATTENTION

The applicant should carefully check the data appearing in this Notification. In case of any discrepancy between these data and the indications in the international application, the applicant should immediately inform the International Bureau.

In addition, the applicant's attention is drawn to the information contained in the Annex, relating to:

☒ time limits for entry into the national phase

☐ confirmation of precautionary designations

☒ requirements regarding priority documents

A copy of this Notification is being sent to the receiving Office and to the International Searching Authority.

The International Bureau of WIPO
34, chemin des Colombettes
1211 G neva 20, Switzerland

Facsimile No. (41-22) 740.14.35

Authorized officer:

S. De Michiel

Telephone No. (41-22) 338.83.88

INFORMATION ON TIME LIMITS FOR ENTERING THE NATIONAL PHASE

The applicant is reminded that the "national phase" must be entered before each of the designated Offices indicated in the Notification of Receipt of Record Copy (Form PCT/IB/301) by paying national fees and furnishing translations, as prescribed by the applicable national laws.

The time limit for performing these procedural acts is **20 MONTHS** from the priority date or, for those designated States which the applicant elects in a demand for international preliminary examination or in a later election, **30 MONTHS** from the priority date, provided that the election is made before the expiration of 19 months from the priority date. Some designated (or elected) Offices have fixed time limits which expire even later than 20 or 30 months from the priority date. In other Offices an extension of time or grace period, in some cases upon payment of an additional fee, is available.

In addition to these procedural acts, the applicant may also have to comply with other special requirements applicable in certain Offices. It is the applicant's responsibility to ensure that the necessary steps to enter the national phase are taken in a timely fashion. Most designated Offices do not issue reminders to applicants in connection with the entry into the national phase.

For detailed information about the procedural acts to be performed to enter the national phase before each designated Office, the applicable time limits and possible extensions of time or grace periods, and any other requirements, see the relevant Chapters of Volume II of the PCT Applicant's Guide. Information about the requirements for filing a demand for international preliminary examination is set out in Chapter IX of Volume I of the PCT Applicant's Guide.

GR and ES became bound by PCT Chapter II on 7 September 1996 and 6 September 1997, respectively, and may, therefore, be elected in a demand or a later election filed on or after 7 September 1996 and 6 September 1997, respectively, regardless of the filing date of the international application. (See second paragraph above.)

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

CONFIRMATION OF PRECAUTIONARY DESIGNATIONS

This notification lists only specific designations made under Rule 4.9(a) in the request. It is important to check that these designations are correct. Errors in designations can be corrected where precautionary designations have been made under Rule 4.9(b). The applicant is hereby reminded that any precautionary designations may be confirmed according to Rule 4.9(c) before the expiration of 15 months from the priority date. If it is not confirmed, it will automatically be regarded as withdrawn by the applicant. There will be no reminder and no invitation. Confirmation of a designation consists of the filing of a notice specifying the designated State concerned (with an indication of the kind of protection or treatment desired) and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.

REQUIREMENTS REGARDING PRIORITY DOCUMENTS

For applicants who have not yet complied with the requirements regarding priority documents, the following is recalled.

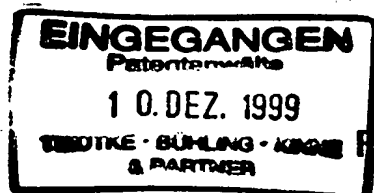
Where the priority of an earlier national, regional or international application is claimed, the applicant must submit a copy of the said earlier application, certified by the authority with which it was filed ("the priority document") to the receiving Office (which will transmit it to the International Bureau) or directly to the International Bureau, before the expiration of 16 months from the priority date, provided that any such priority document may still be submitted to the International Bureau before that date of international publication of the international application, in which case that document will be considered to have been received by the International Bureau on the last day of the 16-month time limit (Rule 17.1(a)).

Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to prepare and transmit the priority document to the International Bureau. Such request must be made before the expiration of the 16-month time limit and may be subjected by the receiving Office to the payment of a fee (Rule 17.1(b)).

If the priority document concerned is not submitted to the International Bureau or if the request to the receiving Office to prepare and transmit the priority document has not been made (and the corresponding fee, if any, paid) within the applicable time limit indicated under the preceding paragraphs, any designated State may disregard the priority claim, provided that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity to furnish the priority document within a time limit which is reasonable under the circumstances.

Where several priorities are claimed, the priority date to be considered for the purposes of computing the 16-month time limit is the filing date of the earliest application whose priority is claimed.

PATENT COOPERATION TREATY

NOTIFICATION OF THE RECORDING
OF A CHANGE

(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bähling-Kinne et al.
Bavariaring 4
D-80336 München
ALLEMAGNE

| | |
|---|--|
| Date of mailing (day/month/year) 06 December 1999 (06.12.99) | IMPORTANT NOTIFICATION |
| Applicant's or agent's file reference WO 23919 | |
| International application No. PCT/EP99/03516 | International filing date (day/month/year) 21 May 1999 (21.05.99) |

| | | |
|---|---|--|
| 1. The following indications appeared on record concerning: | | |
| <input checked="" type="checkbox"/> the applicant | <input type="checkbox"/> the inventor | <input type="checkbox"/> the agent <input type="checkbox"/> the common representative |
| Name and Address NOKIA TELECOMMUNICATIONS OY Keilalahdentie 4 FIN-02150 Espoo Finland | State of Nationality FI | State of Residence FI |
| | Telephone No. +358 9 1807 0 | |
| | Facsimile No. +358 9 1807 496 | |
| | Teleprinter No. | |
| 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning: | | |
| <input type="checkbox"/> the person | <input checked="" type="checkbox"/> the name | <input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence |
| Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland | State of Nationality FI | State of Residence FI |
| | Telephone No. +358 9 1807 0 | |
| | Facsimile No. +358 9 1807 496 | |
| | Teleprinter No. | |
| 3. Further observations, if necessary: | | |
| 4. A copy of this notification has been sent to: | | |
| <input checked="" type="checkbox"/> the receiving Office | <input type="checkbox"/> the designated Offices concerned | |
| <input type="checkbox"/> the International Searching Authority | <input type="checkbox"/> the elected Offices concerned | |
| <input type="checkbox"/> the International Preliminary Examining Authority | <input type="checkbox"/> other: | |

| | |
|---|-------------------------------------|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 G neva 20, Switz rland | Authorized officer S. De Michiel |
| Facsimile No.: (41-22) 740.14.35 | Telephone No.: (41-22) 338.53.38 |

PCT

**NOTICE INFORMING THE APPLICANT OF THE
COMMUNICATION OF THE INTERNATIONAL
APPLICATION TO THE DESIGNATED OFFICES**

(PCT Rule 47.1(c), first sentence)

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne et al.
Bavariaring 4
80336 München
ALLEMAGNE

EINGEGANGEN
Patentanwälte
- 8. Dez. 2000
TIEDTKE - BÜHLING - KINNE
& PARTNER (GmbH)

| | | |
|---|--|--------------------------------|
| Date of mailing (day/month/year) 30 November 2000 (30.11.00) | | |
| Applicant's or agent's file reference WO 23919 | | IMPORTANT NOTICE |
| International application No. PCT/EP99/03516 | International filing date (day/month/year) 21 May 1999 (21.05.99) | Priority date (day/month/year) |
| Applicant NOKIA NETWORKS OY et al | | |

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:
AU, KP, KR, US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE, AL, AM, AP, AT, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EA, EE, EP, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, OA, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 30 November 2000 (30.11.00) under No. WO 00/72624

REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a **demand for international preliminary examination** must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the **national phase**, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

| | |
|--|--|
| <p style="text-align: center;">The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> | <p>Authorized officer J. Zahra</p> |
| Facsimile No. (41-22) 740.14.35 | Telephone No. (41-22) 338.83.38 |

ENT COOPERATION TREA

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Commissioner
 US Department of Commerce
 United States Patent and Trademark
 Office, PCT
 2011 South Clark Place Room
 CP2/5C24
 Arlington, VA 22202
 ETATS-UNIS D'AMERIQUE
 in its capacity as elected Office

| | |
|---|--|
| Date of mailing (day/month/year) 18 December 2000 (18.12.00) | |
| International application No. PCT/EP99/03516 | Applicant's or agent's file reference WO 23919 |
| International filing date (day/month/year) 21 May 1999 (21.05.99) | Priority date (day/month/year) |
| Applicant KOISTINEN, Tommi | |

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:
 14 November 2000 (14.11.00)

☐ in a notice effecting later election filed with the International Bureau on:

2. The election ☒ was
☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

| | |
|---|---|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35 | Authorized officer F. Baechler Telephone No.: (41-22) 338.83.38 |
|---|---|

PATENT COOPERATION TREATY

PCT

INFORMATION CONCERNING ELECTED OFFICES NOTIFIED OF THEIR ELECTION

(PCT Rule 61.3)

From the INTERNATIONAL BUREAU

T :

LESON, Thomas, Johannes, Alois
Tiedtke-Bühling-Kinne

Bavariaring 4
D-80336 München Patentanwälte

ALLEMAGNE

- 3. Jan. 2001

TIEDTKE · BÜHLING · KINNE
& PARTNER (GmbH)

| | | |
|--|---|---------------------------------------|
| Date of mailing (day/month/year) 18 December 2000 (18.12.00) | | |
| Applicant's or agent's file reference WO 23919 | | IMPORTANT INFORMATION |
| International application No. PCT/EP99/03516 | International filing date (day/month/year) 21 May 1999 (21.05.99) | Priority date (day/month/year) |
| Applicant NOKIA NETWORKS OY et al | | |

1. The applicant is hereby informed that the International Bureau has, according to Article 31(7), notified each of the following Offices of its election:

AP : GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW

EP : AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

National : AU, BG, CA, CN, CZ, DE, IL, JP, KP, KR, MN, NO, NZ, PL, RO, RU, SE, SK, US

2. The following Offices have waived the requirement for the notification of their election; the notification will be sent to them by the International Bureau only upon their request:

EA : AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

OA : BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

National : AE, AL, AM, AT, AZ, BA, BB, BR, BY, CH, CU, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IN, IS, KE, KG, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MW, MX, PT, SD, SG, SI, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW

3. The applicant is reminded that he must enter the "national phase" before the expiration of 30 months from the priority date before each of the Offices listed above. This must be done by paying the national fee(s) and furnishing, if prescribed, a translation of the international application (Article 39(1)(a)), as well as, where applicable, by furnishing a translation of any annexes of the international preliminary examination report (Article 36(3)(b) and Rule 74.1).

Some offices have fixed time limits expiring later than the above-mentioned time limit. For detailed information about the applicable time limits and the acts to be performed upon entry into the national phase before a particular Office, see Volume II of the PCT Applicant's Guide.

The entry into the European regional phase is postponed until 31 months from the priority date for all States designated for the purposes of obtaining a European patent.

| | |
|--|---|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. (41-22) 740.14.35 | Authorized officer: <div style="text-align: right;"> F. Baechler </div> Telephone No. (41-22) 338.83.38 |
|--|---|

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF THE RECORDING
OF A CHANGE(PCT Rule 92bis.1 and
Administrative Instructions, Section 422)

From the INTERNATIONAL BUREAU

To:

PELLMANN, Hans-Bernd
Tiedtke-Bühling-Kinne et al.
Bavariaring 4
80336 München
ALLEMAGNE

| | |
|--|--|
| Date of mailing (day/month/year) 24 January 2002 (24.01.02) | IMPORTANT NOTIFICATION |
| Applicant's or agent's file reference WO 23919 | |
| International application No. PCT/EP99/03516 | International filing date (day/month/year) 21 May 1999 (21.05.99) |

| | |
|--|----------------------------|
| 1. The following indications appeared on record concerning: | |
| <input checked="" type="checkbox"/> the applicant <input type="checkbox"/> the inventor <input type="checkbox"/> the agent <input type="checkbox"/> the common representative | |
| Name and Address NOKIA NETWORKS OY Keilalahdentie 4 FIN-02150 Espoo Finland | State of Nationality FI |
| | State of Residence FI |
| | Telephone No. |
| | Facsimile No. |
| Teleprinter No. | |
| 2. The International Bureau hereby notifies the applicant that the following change has been recorded concerning: | |
| <input type="checkbox"/> the person <input checked="" type="checkbox"/> the name <input type="checkbox"/> the address <input type="checkbox"/> the nationality <input type="checkbox"/> the residence | |
| Name and Address NOKIA CORPORATION Keilalahdentie 4 FIN-02150 Espoo Finland | State of Nationality |
| | State of Residence |
| | Telephone No. |
| | Facsimile No. |
| Teleprinter No. | |
| 3. Further observations, if necessary: | |
| 4. A copy of this notification has been sent to: | |
| <input checked="" type="checkbox"/> the receiving Office <input type="checkbox"/> the designated Offices concerned <input type="checkbox"/> the International Searching Authority <input checked="" type="checkbox"/> the elected Offices concerned <input type="checkbox"/> the International Preliminary Examining Authority <input type="checkbox"/> other: | |

| | |
|---|--|
| The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35 | Authorized officer Jaime LEITAO Telephone No.: (41-22) 338.83.38 |
|---|--|

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

| | | |
|--|---|---|
| Applicant's or agent's file reference WO 23919 | FOR FURTHER ACTION see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below. | |
| International application No. PCT/EP 99/ 03516 | International filing date (day/month/year) 21/05/1999 | (Earliest) Priority Date (day/month/year) |
| Applicant NOKIA TELECOMMUNICATIONS OY et al. | | |

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

2
☐ None of the figures.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/03516

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q11/04 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|------------------------|
| X | EP 0 782 302 A (LUCENT TECHNOLOGIES INC) 2 July 1997 (1997-07-02) column 1, line 30-58 column 2, line 15 -column 3, line 5 column 5, line 44 -column 6, line 10 column 7, line 14-42 claims 1-3 | 1-4, 10-12 |
| Y | --- | 5, 6, 9, 13, 14, 17 |
| | -/-- | |



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

21 October 1999

Date of mailing of the international search report

05/11/1999

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Kalabic, F

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/EP 99/03516

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | NANYING YIN ET AL: "A DYNAMIC RATE CONTROL MECHANISM FOR INTEGRATED NETWORKS", NETWORKING IN THE NINETIES, BAL HARBOUR, APR. 7 - 11, 1991, VOL. VOL. 2, NR. CONF. 10, PAGE(S) 543 - 552, INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS XP000223378 ISBN: 0-87942-694-2 abstract page 545, left-hand column, paragraph 1 page 546, left-hand column, paragraph 4 page 548, left-hand column, paragraph 3 - right-hand column, paragraph 1 page 549, left-hand column, paragraph 3 page 549, right-hand column, line 7 - line 16 --- | 1-3, 7, 15 |
| X | EP 0 790 725 A (FUJITSU LTD) 20 August 1997 (1997-08-20) column 1, line 18-21 column 3, line 23-28 --- | 1, 7, 15 |
| A | --- | 8, 16 |
| Y | EP 0 706 297 A (IBM) 10 April 1996 (1996-04-10) abstract page 4, line 55-59 page 5, line 1-3 --- | 5, 13 |
| A | --- | 8, 16 |
| Y | HAAS Z: "ADAPTIVE ADMISSION CONGESTION CONTROL", COMPUTER COMMUNICATIONS REVIEW, VOL. 21, NR. 5, PAGE(S) 58 - 76 XP000240808 ISSN: 0146-4833 page 62, line 6 - line 31 --- | 9, 17 |
| Y | US 5 805 591 A (GHAIBEH GIHAD ET AL) 8 September 1998 (1998-09-08) abstract column 2, line 30 - line 45 --- | 6, 14 |
| A | ----- | 8, 16 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/03516

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|---|---------------------|----------------------------|---------------------|
| EP 0782302 A | 02-07-1997 | US 5701292 A | 23-12-1997 |
| | | JP 9181744 A | 11-07-1997 |
| EP 0790725 A | 20-08-1997 | JP 2865782 B | 08-03-1999 |
| | | JP 3267846 A | 28-11-1991 |
| | | CA 2038436 A, C | 17-09-1991 |
| | | DE 69131365 D | 29-07-1999 |
| | | EP 0446956 A | 18-09-1991 |
| | | US 5544170 A | 06-08-1996 |
| EP 0706297 A | 10-04-1996 | US 5790522 A | 04-08-1998 |
| US 5805591 A | 08-09-1998 | AU 1965897 A | 16-09-1997 |
| | | EP 0893015 A | 27-01-1999 |
| | | WO 9732411 A | 04-09-1997 |

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

LESON, Thomas J
TIEDTKE, BÜHLING, KINNE & PARTNER
Bavariaring 4
D-80336 München
ALLEMAGNE

EINGEGANGEN
Patentanwälte

- 9. April 2001

TIEDTKE · BÜHLING · KINNE
& PARTNER (GbR)

PCT

WRITTEN OPINION

(PCT Rule 66)

| | |
|-------------------------------------|------------|
| Date of mailing (day/month/year) | 05.04.2001 |
|-------------------------------------|------------|

Applicant's or agent's file reference
WO 23919

REPLY DUE **within 3 month(s)**
from the above date of mailing

International application No.
PCT/EP99/03516

International filing date (day/month/year)
21/05/1999

Priority date (day/month/year)
21/05/1999

International Patent Classification (IPC) or both national classification and IPC
H04Q11/04

Applicant

NOKIA TELECOMMUNICATIONS OY et al.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.

2. This opinion contains indications relating to the following items:

- I ☒ Basis of the opinion
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☐ Certain document cited
- VII ☒ Certain defects in the international application
- VIII ☐ Certain observations on the international application

3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.

4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: **21/09/2001.**

5.7.01 ✓

Name and mailing address of the international preliminary examining authority:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0 Tx: 523656 epmu d
Fax: +49 89 2399 - 4465

Authorized officer / Examiner

Schweitzer, J-C

Formalities officer (incl. extension of time limits)

Cremona, P

Telephone No. +49 89 2399 8244



I. Basis of the opinion

1. This opinion has been drawn on the basis of (*substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed".*):

Description, pages:

1-11 as originally filed

Claims, No.:

1-17 as originally filed

Drawings, sheets:

1/2-2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|--------|------------------|
| Novelty (N) | Claims | 1, 10 |
| Inventive step (IS) | Claims | 1 -7, 9 - 15, 17 |
| Industrial applicability (IA) | Claims | |

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Concerning section V.2 (reasoned statement under Article 35(2) PCT)

The following documents (D) are referred to in this written opinion:

D1 = EP-A-0 706 297 (IBM)

D2 = cited article by Nanying et al. [IEEE Infocom' 91]

D3 = EP-A-0 782 302 (Lucent)

The alleged invention generally relates to a network interface (gateway) wherein the transfer rate or data rate can be controlled in response to the detected load on the network. This general concept of adjusting the data rate in dependence on a load or congestion indication received from the network is well-known on the art and e.g. disclosed in any of the three above-cited references.

In particular, referring to the wording of present **claim 1**, document **D1**, see col. 3, lines 23 to col. 4, line 27, already describes such an interface (terminal equipment) for receiving and transmitting data on a network (1) comprising transceiver means (coder 15), means for detecting the load upon the network based on the so-called CS information and control means (sending rate controller 2) for adjusting the coding or transfer rate of said transceiver in response to the detected load.

Claim 1 is thus entirely anticipated by the content of document **D1** and hence lacks novelty (Article 33(2) PCT).

Furthermore, even if the applicant were to interpret claim 1 in such a manner as to enable him to allege that its subject-matter is novel, e.g. because **D1** does not explicitly mention that the transfer rate is controlled by the network load but uses therefor the number/rate of discarded cells, it does not seem to involve an inventive step, contrary to Article 33(3) PCT, in the light of said document as well as the above cited documents **D2**, see the abstract and part 5.2 and **D3**, see the abstract, which aim at the same object and essentially provide the same solution as the present application, namely adapting the data rate of coders (or of data sources in **D3**) based on network feedback information relative to the load or level of congestion on the network.

The method features of independent method **claim 10** correspond in essence with

the structural features of claim 1 and hence the arguments concerning lack of novelty and inventive step set out above apply equally to said claim 10.

The dependent **claims 2 - 7, 9 and 11 - 15, 17** appear to add nothing of inventive significance to claims 1 and 10, respectively, as the additional features introduced by said dependent claims refer only to minor implementing details which are known or directly derivable from the above-cited prior art references (e.g. the use of a plurality of transceivers having different, predetermined transfer rates, as per claims 2 to 4, 11 and 12, which is to be taken from **D3**, or the provision of a variable-rate codec, as defined in claims 7 and 15, which is taught by **D1**) or fall within the general knowledge or technical competence of a person skilled in the art, e.g. the provision of variable-rate modems or the use of test packets for determining the load on a network.

Thus, these dependent claims appear to add nothing of inventive significance to those claims to which they are appended.

However, the subject-matter of the dependent **claim 8**, which is concerned with a particular embodiment of the invention wherein the modem and the codec are provided with different priorities and the codec gets a higher transfer rate, is neither known from, nor rendered obvious by, the available prior art and these features could therefore, in suitable combination with those of present claims 1 and 5, form the basis for a new, inventive main claim.

Similar considerations apply to the corresponding method **claim 16**.

Concerning section VII (form and contents).

The independent claims should be drafted in the proper two-part "characterised" form recommended by Rule 6.3.(b),(i),(ii) PCT, having a preamble that correctly reflects the nearest prior art, presumably that represented by the above noted **D1**.

If any amended independent claims are filed, the opening part of the description including the summary of the invention (on pages 4 to 6) should be brought into agreement with the wording thereof.

In order to meet the requirements of Rule 5.1.(a),(ii) PCT, the relevant prior art documents noted above should be acknowledged by reference and briefly discussed in

the introductory part of the description.

All the claims should include reference signs in parentheses where features shown in the drawings are referred to, Rule 6.2.(b) PCT.

The attention of the applicant is finally drawn to the fact that the application may not be amended in such a way that it contains subject-matter which extends beyond the content of the application as filed, Article 34(2)(b) PCT. Amendments should be filed by way of replacement pages in the manner stipulated by Rule 66.8(a) PCT. In particular, fair copies of the amendments should be filed preferably in triplicate. Moreover, the applicant's attention is drawn to the fact that, as a consequence of Rule 66.8(a) PCT the examiner is not permitted to carry out any amendments under the PCT procedure, however minor these may be.



TBK-Patent POB 20 19 18 80019 München

An das
Europäische Patentamt

80298 München

Patentanwälte

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Dipl.-Ing. Hans-Ludwig Trösch
Dipl.-Ing. Alexander Kühn
Dipl.-Chem. Dr. Andreas Oser
Dipl.-Ing. Rainer Böckelen
Dipl.-Ing. Stefan Klingele
Dipl.-Chem. Stefan Bühlung
Dipl.-Ing. Ronald Roth

August 2, 2001

PCT Patent Application No.: PCT/EP99/03516

NOKIA NETWORKS OY

Our ref.: WO 23919

(F: 5.8.01, Eing.)

Reference is made to the Written Opinion pursuant to Rule
66 PCT dated April 5, 2001.

Enclosed new claims 1 to 6 replacing the original claims 1
to 17 are filed, upon which the further prosecution of the
application is to be based.

Furthermore, new description pages 4, 5 and 5a replacing
the original description pages 4 and 5 are filed. The
amendments are highlighted by using a different font. The
description has been adapted to the new claims and
documents D1 to D3 were acknowledged.

The new independent claim 1 is based on the original
independent claim 1 and the original dependent claims 3, 5
and 8. The new dependent claim 2 is based on the original
claim 2, and the new dependent claim 3 is based on the
original claim 9. The new independent claim 4 is based on
the original independent claim 10 and the original
dependent claims 12, 13 and 16. The new dependent claim 5
is based on the original claim 11, and the new dependent
claim 6 is based on the original claim 17.

Deutsche Bank München Kto. 286 1060 BLZ 700 700 10
Dr. sdner Bank München Kto. 3939 844 BLZ 700 800 00
Postbank München Kto. 67043 804 BLZ 700 100 80
Dai-Ichi-Kangyo Bank München Kto. 8104233007 BLZ 300 207 00
Sanwa Bank Düsseldorf Kto. 500 047 BLZ 301 307 00
//36

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Thus, the new independent claims 1 and 4 were amended as suggested by the examiner under in the above-referenced Written Opinion.

The new independent claims 1 and 4 are delimited against prior art document EP-A-0 790 725. It is assumed that this document was meant in the above-referenced Written Opinion as document D1 and not EP 0 706 297 A1. This is because it appears that only document EP-A-0 790 725 discloses the structure described in the Written Opinion comprising a network (1) and a controller (2) using so-called CS information or a coder 15, as shown for example in Figs. 1 and 2A and the corresponding description in column 3, lines 23 to 38.

Since the Examiner has already indicated in the above-referenced Written Opinion that new independent claims as suggested by him would be allowable, he is kindly asked to correspondingly issue a favorable international preliminary examination report at the next stage of the proceedings.

Thomas J.A. Leson
Patentanwalt
TBK-Patent

Enclosure:

- New claims 1 to 6
- New description pages 4, 5 and 5a

Enclosure of August 2, 2001

PCT Patent Application No.: PCT/EP99/03516

NOKIA NETWORKS OY

Our ref.: WO 23919

New claims 1 to 6

1. An interface establishing device for transmitting data to and receiving data from a network (4), comprising a transceiver means (31, 33) being operable with variable transfer rates,

5 a detecting means (34) for detecting the load upon said network (4), and

a control means (32) for adjusting the transfer rate of said transceiver means (31, 33) in response to the detected load,

10 **characterized in that**

said transceiver means comprise a plurality of transceiver means, and said control means (32) is adapted to provide each of said plurality of transceiver means (31, 33) with different priorities and to adjust a

15 transfer rate of a transceiver means (33) with a higher priority on a higher value than the transfer rate of a transceiver means (31) with a lower priority, wherein

said transceiver means comprise a modem (31) for modulating and demodulating of non-speech data (TE_M,

20 IP_M) and a codec (33) for encoding and decoding of speech data (TE_C, IP_C), wherein said control means (32) is adapted to provide said codec (33) with a higher priority than the modem (31).

2. The interface establishing device according to claim 1, **characterized in that** said transceiver means (31, 33) comprise a plurality of predetermined transfer rates and said control means (32) is adapted to select one of said
5 predetermined transfer rates in response to said detected load.

3. The interface establishing device according to claim 1 or 2, **characterized in that** said control means (32) is
10 adapted to send a test packet to a predetermined destination over said network (4), receive said test packet back from said predetermined destination and analyse the delay occurred in order to determine the load on said network.
15

4. A method for transmitting data to and receiving data from a network (4), comprising the steps of
detecting (S1) the load on said network (4), and
adjusting (S2, S3, S4) a transfer rate of a
20 transceiver means (31, 33) in response to said detected load,

characterized in that

said transceiver means comprise a plurality of transceiver means, the method further comprising the
25 steps of

providing different priorities for each of said plurality of transceiver means (31, 33) and adjusting a transfer rate of a transceiver means (33) with a higher priority on a higher value than the transfer rate of a
30 transceiver means (31) with a lower priority, wherein

said transceiver means comprises a modem (31) for modulating and demodulating of non-speech data (TE_M, IP_M) and a codec (33) for encoding and decoding of

speech data (**TE_C, IP_C**), and said codec (**33**) is provided with a higher priority than the modem (**31**).

5. The method according to claim 4,

5 **characterized in that** in said transceiver means (**31, 33**) comprise a plurality of predetermined transfer rates and in said adjusting step (**S2, S3, S4**) one of said predetermined transfer rates is selected in response to said detected load.

10

6. The method according to claim 4 or 5

characterized by further comprising the steps of sending a test packet to a predetermined destination over said network (**4**);

15 receiving said test packet back from said predetermined destination; and

 analysing the delay occurred in order to determine the load on said network.

20

higher data amount required for the handling of the protocol.

In case of an overload or a congestion, UDP is not
5 capable to detect whether any failure in the transmission
have occurred. Moreover, in case of a congestion the
situation in the IP network is worsen by UDP since the
data packets are transferred via the network with a
constant rate.

10

In order to make the transmission safer when using UDP,
the receiving end can send back in its payloads the
information received, such that it can be checked whether
the data have been received safely. Alternatively, the
15 UDP could be provided with an acknowledge mechanism like
RTCP (Real Time Control Protocol) messages. However,
these possibilities both lead to a higher amount of data
to be sent via the network, which worsens the congestion
situation.

20

Thus, by using the conventional techniques, in case of an
overload and congestion of the network, the transmission
quality is decreased since packets are delayed or even
get lost.

25

Document EP-A-0 790 725, forming prior art as described in the preambles
of claims 1 and 4, discloses an ATM transmission system with a variable
transmission rate. The sending rate of a transmitter 14 is decreased when a
discard of cells, i.e., a loss of data packets occurs.

30

The article "A Dynamic Rate Control Mechanism for Integrated Networks" by
Nanyang Yin et al, Network In The Nineties, Bal harbour, Apr. 7-11, 1991,
Vol. 2, Nr. Conf. 10, pages 543 - 552, IEEE, describes a control by which the
source coding rate is adjusted based on network feedback information.

Furthermore, also congestion of a network is detected, and in case of congestion in the network, the rate is decreased.

Moreover, document EP-A-0 782 302 describes a method and apparatus for
5 controlling data transfer rates of sources in ATM networks. In particular, according to this document the transfer rates of a plurality of data sources are controlled on the basis of a detected congestion state.

10 SUMMARY OF THE INVENTION

The object underlying this invention resides in removing the above drawbacks and to enable a sufficient transmission quality even in case of congestion of a
15 network.

This object is solved by an interface establishing device for transmitting data to and receiving data from a network, comprising a transceiver means being operable
20 with variable transfer rates, a detecting means for detecting the load upon said network, and a control means for adjusting the transfer rate of said transceiver means in response to the detected load, characterized in that said transceiver means comprise a plurality of transceiver means, and said
25 control means is adapted to provide each of said plurality of transceiver means with different priorities and to adjust a transfer rate of a transceiver means with a higher priority on a higher value than the transfer rate of a transceiver means with a lower priority, wherein said transceiver means comprise a modem for modulating and demodulating of non-speech data
30 and a codec for encoding and decoding of speech data, wherein said control means is adapted to provide said codec with a higher priority than the modem.

Alternatively, the above object is achieved by a method for transmitting data to and receiving data from a network, comprising the steps of detecting the load on said network, and adjusting a transfer rate of a
5 transceiver means in response to said detected load, characterized in that said transceiver means comprise a plurality of transceiver means, the method further comprising the steps of providing different priorities for each of said plurality of transceiver means and adjusting a transfer rate of a transceiver means with a higher priority on a
10 higher value than the transfer rate of a transceiver means with a lower priority, wherein said transceiver means comprises a modem for modulating and demodulating of non-speech data and a codec for encoding and decoding of speech data, and said codec is provided with a higher priority than the modem.

15 Thus, it is possible to adapt the transfer rate of a modem or a codec in response to the load or congestion of a network.

20 That is, in the interface establishing device (gateway) and method for transmitting data to and receiving data from a network according to the present invention, the transfer rate (data rate) can be adapted to the present load on the network. That is, in case a congestion
25 occurs, the transfer rate can be set on a lower value such that data packets can be safely transmitted via the network.

Thus, the transmission quality can be maintained on a
30 sufficient level, since no packet delay or even losses can occur. Only the bandwidth of the speech signal is slightly reduced due to the decreased transfer rate. That is, the speech quality might be reduced slightly, but the end-to-end link stays at least available.

PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

To:

LESON, Thomas J
TIEDTKE, BÜHLING, KINNE & PARTNER
Bavariaring 4
D-80336 München
ALLEMAGNE

EINGEGANGEN

09. Okt. 2001

TBK - PATENT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
(day/month/year)

08.10.2001

Applicant's or agent's file reference
WO 23919

IMPORTANT NOTIFICATION

International application No.
PCT/EP99/03516

International filing date (day/month/year)
21/05/1999

Priority date (day/month/year)
21/05/1999

Applicant
NOKIA TELECOMMUNICATIONS OY et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/



European Patent Office
D-80298 Munich
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Fax: +49 89 2399 - 4465

Authorized officer



Finnie, A

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| | | |
|---|---|--|
| Applicant's or agent's file reference WO 23919 | | FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
| International application No. PCT/EP99/03516 | International filing date (day/month/year) 21/05/1999 | Priority date (day/month/year) 21/05/1999 |
| International Patent Classification (IPC) or national classification and IPC H04Q11/04 | | |
| Applicant NOKIA TELECOMMUNICATIONS OY et al. | | |
| <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 6 sheets.</p> | | |
| <p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none">I <input checked="" type="checkbox"/> Basis of the reportII <input type="checkbox"/> PriorityIII <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicabilityIV <input type="checkbox"/> Lack of unity of inventionV <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statementVI <input type="checkbox"/> Certain documents citedVII <input type="checkbox"/> Certain defects in the international applicationVIII <input type="checkbox"/> Certain observations on the international application | | |
| Date of submission of the demand 14/11/2000 | | Date of completion of this report 08.10.2001 |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | | Authorized officer Schweitzer, J-C Telephone No. +49 89 2399 8963  |

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP99/03516

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-3,6-11 as originally filed

4,5,5A as received on 02/08/2001 with letter of 02/08/2001

Claims, No.:

1-6 as received on 02/08/2001 with letter of 02/08/2001

Drawings, sheets:

1/2,2/2 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. PCT/EP99/03516

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | | |
|-------------------------------|------|--------|-------|
| Novelty (N) | Yes: | Claims | 1 - 6 |
| | No: | Claims | |
| Inventive step (IS) | Yes: | Claims | 1 - 6 |
| | No: | Claims | |
| Industrial applicability (IA) | Yes: | Claims | 1 - 6 |
| | No: | Claims | |

- 2. Citations and explanations
see separate sheet**

Concerning section V.2 (reasoned statement under Article 35(2) PCT)

Claim 1 relates to a network interface wherein the transfer rate or data rate can be controlled in response to the detected load on the network. Such interfaces or gateways permitting to adjust the data rate of transceivers comprised in the interface in dependence on a load or congestion indication received from the network are generally known in the art, e.g. from the cited **EP-A-0 790 725 (Fujitsu)**.

In the interface defined in amended claim 1, a plurality of transceivers having different priorities are used including a modem for modulating /demodulating non-speech signals and a codec for coding/decoding speech signals, said codec being provided with a higher priority than the modem.

Such an arrangement as claimed is neither taught, nor rendered obvious, alone or in combination, by the prior art documents acknowledged in the description or cited in the International Search Report, which generally disclose the idea of adapting the data rate of coders (or of data sources) based on network feedback information relative to the load or level of congestion on the network without any incentive for the skilled person to arrive at the present invention.

Claim 1 is therefore novel and considered to involve the required inventive step, Articles 33(2) and (3) PCT. The subject-matter of claim 1 is also industrially applicable.

The same applies to independent claim 4 which is drafted in terms of method steps and corresponds essentially to apparatus claim 1. Claim 4, therefore, equally meets all the requirements of Article 33 PCT.

Dependent claims 2, 3, 5 and 6 relate to further implementing details of the interface/method defined by the independent claims to which they refer and are thus equally novel, inventive and industrially applicable.

PCT Patent Application No. PCT/EP99/03516
Nokia Networks
WO 23919

- 4 -

higher data amount required for the handling of the protocol.

In case of an overload or a congestion, UDP is not
5 capable to detect whether any failure in the transmission
have occurred. Moreover, in case of a congestion the
situation in the IP network is worsen by UDP since the
data packets are transferred via the network with a
constant rate.

10

In order to make the transmission safer when using UDP,
the receiving end can send back in its payloads the
information received, such that it can be checked whether
the data have been received safely. Alternatively, the
15 UDP could be provided with an acknowledge mechanism like
RTCP (Real Time Control Protocol) messages. However,
these possibilities both lead to a higher amount of data
to be sent via the network, which worsens the congestion
situation.

20

Thus, by using the conventional techniques, in case of an
overload and congestion of the network, the transmission
quality is decreased since packets are delayed or even
get lost.

25

Document EP-A-0 790 725, forming prior art as described in the preambles
of claims 1 and 4, discloses an ATM transmission system with a variable
transmission rate. The sending rate of a transmitter 14 is decreased when a
discard of cells, i.e., a loss of data packets occurs.

30

The article "A Dynamic Rate Control Mechanism for Integrated Networks" by
Nanying Yin et al, Network In The Nineties, Bal harbour, Apr. 7-11, 1991,
Vol. 2, Nr. Conf. 10, pages 543 - 552, IEEE, describes a control by which the
source coding rate is adjusted based on network feedback information.

- 5 -

Furthermore, also congestion of a network is detected, and in case of congestion in the network, the rate is decreased.

Moreover, document EP-A-0 782 302 describes a method and apparatus for
5 controlling data transfer rates of sources in ATM networks. In particular, according to this document the transfer rates of a plurality of data sources are controlled on the basis of a detected congestion state.

10 SUMMARY OF THE INVENTION

The object underlying this invention resides in removing the above drawbacks and to enable a sufficient transmission quality even in case of congestion of a
15 network.

This object is solved by an interface establishing device for transmitting data to and receiving data from a network, comprising a transceiver means being operable
20 with variable transfer rates, a detecting means for detecting the load upon said network, and a control means for adjusting the transfer rate of said transceiver means in response to the detected load, characterized in that said transceiver means comprise a plurality of transceiver means, and said
25 control means is adapted to provide each of said plurality of transceiver means with different priorities and to adjust a transfer rate of a transceiver means with a higher priority on a higher value than the transfer rate of a transceiver means with a lower priority, wherein said transceiver means comprise a modem for modulating and demodulating of non-speech data
30 and a codec for encoding and decoding of speech data, wherein said control means is adapted to provide said codec with a higher priority than the modem.

- 5a -

Alternatively, the above object is achieved by a method for transmitting data to and receiving data from a network, comprising the steps of detecting the load on said network, and adjusting a transfer rate of a transceiver means in response to said detected load, characterized in that said transceiver means comprise a plurality of transceiver means, the method further comprising the steps of providing different priorities for each of said plurality of transceiver means and adjusting a transfer rate of a transceiver means with a higher priority on a higher value than the transfer rate of a transceiver means with a lower priority, wherein said transceiver means comprises a modem for modulating and demodulating of non-speech data and a codec for encoding and decoding of speech data, and said codec is provided with a higher priority than the modem.

Thus, it is possible to adapt the transfer rate of a modem or a codec in response to the load or congestion of a network.

That is, in the interface establishing device (gateway) and method for transmitting data to and receiving data from a network according to the present invention, the transfer rate (data rate) can be adapted to the present load on the network. That is, in case a congestion occurs, the transfer rate can be set on a lower value such that data packets can be safely transmitted via the network.

Thus, the transmission quality can be maintained on a sufficient level, since no packet delay or even losses can occur. Only the bandwidth of the speech signal is slightly reduced due to the decreased transfer rate. That is, the speech quality might be reduced slightly, but the end-to-end link stays at least available.

Enclosure of August 2, 2001

PCT Patent Application No.: PCT/EP99/03516

NOKIA NETWORKS OY

Our ref.: WO 23919

New claims 1 to 6

1. An interface establishing device for transmitting data to and receiving data from a network (4), comprising a transceiver means (31, 33) being operable with variable transfer rates,

5 a detecting means (34) for detecting the load upon said network (4), and

a control means (32) for adjusting the transfer rate of said transceiver means (31, 33) in response to the detected load,

10 **characterized in that**

said transceiver means comprise a plurality of transceiver means, and said control means (32) is adapted to provide each of said plurality of transceiver means (31, 33) with different priorities and to adjust a

15 transfer rate of a transceiver means (33) with a higher priority on a higher value than the transfer rate of a transceiver means (31) with a lower priority, wherein

said transceiver means comprise a modem (31) for modulating and demodulating of non-speech data (TE_M, 20 IP_M) and a codec (33) for encoding and decoding of speech data (TE_C, IP_C), wherein said control means (32) is adapted to provide said codec (33) with a higher priority than the modem (31).

- 2/3 -

2. The interface establishing device according to claim 1, **characterized in that** said transceiver means (31, 33) comprise a plurality of predetermined transfer rates and said control means (32) is adapted to select one of said
5 predetermined transfer rates in response to said detected load.

10 *sub a1*
3. The interface establishing device according to claim 1 or 2, **characterized in that** said control means (32) is adapted to send a test packet to a predetermined destination over said network (4), receive said test packet back from said predetermined destination and analyse the delay occurred in order to determine the load
15 on said network.

20 4. A method for transmitting data to and receiving data from a network (4), comprising the steps of
detecting (S1) the load on said network (4), and
adjusting (S2, S3, S4) a transfer rate of a
transceiver means (31, 33) in response to said detected load,

characterized in that

25 said transceiver means comprise a plurality of transceiver means, the method further comprising the steps of

providing different priorities for each of said plurality of transceiver means (31, 33) and adjusting a transfer rate of a transceiver means (33) with a higher priority on a higher value than the transfer rate of a
30 transceiver means (31) with a lower priority, wherein

said transceiver means comprises a modem (31) for modulating and demodulating of non-speech data (TE_M, IP_M) and a codec (33) for encoding and decoding of

- 3/3 -

speech data (**TE_C**, **IP_C**), and said codec (**33**) is provided with a higher priority than the modem (**31**).

5. The method according to claim 4,

5 **characterized in that** in said transceiver means (**31**, **33**) comprise a plurality of predetermined transfer rates and in said adjusting step (**S2**, **S3**, **S4**) one of said predetermined transfer rates is selected in response to said detected load.

10

6. The method according to claim 4 or 5

sub a2
characterized by further comprising the steps of sending a test packet to a predetermined destination over said network (**4**);

15 receiving said test packet back from said predetermined destination; and

 analysing the delay occurred in order to determine the load on said network.

20

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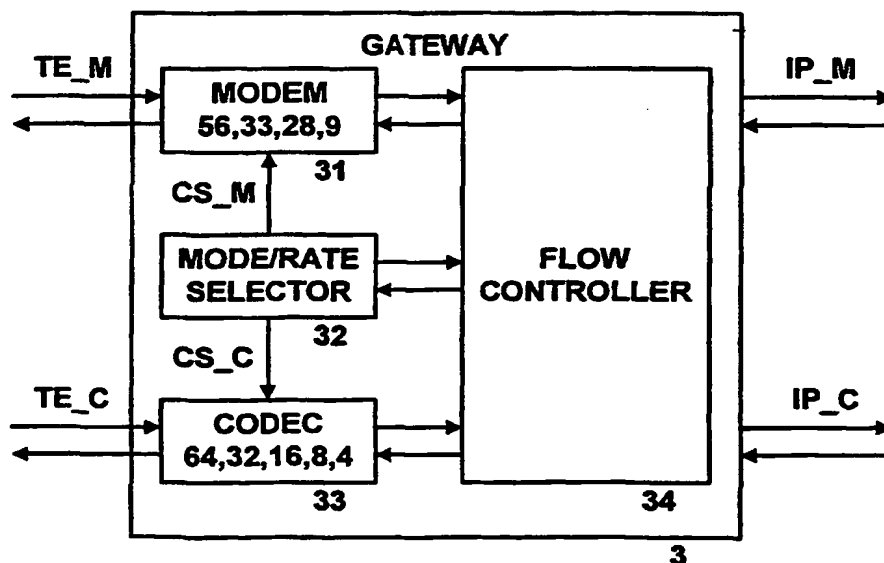
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **ADAPTIVE RATE MATCHING FOR DATA OR SPEECH**



(57) Abstract: The present invention discloses an interface establishing device (3) for transmitting data to and receiving data from a network, comprising transceiver means (31, 33) being operable with variable transfer rates, a detecting means (34) for detecting the load upon said network (4), and a control means (32) for adjusting the transfer rate of said transceiver means (31, 33) in response to the detected load. By this measure it is possible to adapt the transfer rate of a modem or a codec in response to the load or congestion of a network.

ADAPTIVE RATE MATCHING FOR DATA OR SPEECHFIELD OF THE INVENTION

5 The present invention relates to an interface
establishing means and a method for transmitting data to
and receiving data from a network. In particular, the
present invention relates to a gateway between two
different networks and a method for operating such a
10 gateway.

BACKGROUND OF THE INVENTION

In recent years, the Voice over IP (VoIP) technology was
15 developed in which a phone call is sent via an IP-based
network (IP network, Internet Protocol network) such as
the Internet, for example. By sending the signal via such
a network instead of a conventional long distance
carrier, it is possible to reduce the costs involved for
20 such a call.

A general architecture according to the VoIP technology
is shown in Fig. 1. For the purpose of the following
description, the left side of the IP network 4 in Fig. 1
25 is referred to as the near-end side, while the right side
is referred to as the far-end side.

A first communication device 1 such as a mobile phone or
a fixed phone is connected to a first network control
30 device 2 for controlling a first network (near-end
network) to which the mobile phone 1 is connected. The
first network control device 2 is, for example, a mobile
services switching center (MSC). A speech signal is sent
at a bit rate of, e.g., 64 kbps from the first network

- 2 -

control device 2 to a first gateway 3 which connects the near-end network with the IP network 4. The speech signal can be a 64 kbps PCM channel, for example.

5 In order to achieve capacity saving on the IP link, the speech is compressed in the gateway. This compression is performed by a codec (coder-decoder, transcoder, code converter) arranged in the first gateway 3. A typical compression ratio for speech is, for example, 8:1. Since
10 the function of the codec itself is not important to the present invention, a detailed description thereof is omitted here.

The speech signal is compressed, for example, to a bit
15 rate of 8 kbps. The compressed speech signal is sent via the IP network 4 to a second gateway 5. This second gateway also comprises a codec (coder-decoder). However, this codec decompresses the compressed signal received from the IP network 4 to restore the original rate (i.e.,
20 in the above example, 64 kbps). The decompressed speech signal is sent to a second network control device 6 for controlling a second network (far-end network) to which a phone 7 as a second communication device is connected. The second network control device 6 can be a mobile
25 services switching center (MSC) in case the phone 7 is a mobile phone or a fixed services switching center (FSC) in case the phone 7 is a fixed phone. The second network control device 6 sends the signal to the destination
30 phone 7.

As described above, the speech signal is compressed and decompressed. In case of a speech signal, this can be effected by using a codec, as described above. The compression serves to save capacity in the IP network.

- 3 -

Furthermore, by compressing the signal, the transmission is not so sensitive to dropped and/or delayed packets as in the case of a non-compressed transmission.

5 Fax and dial-up modems use the same 64 kbps PCM signal as the speech signal does. If such signals (in the following referred to as modem signals) would be processed in the same way as the speech signal (i.e., transmitted via the codec), the modem connections could be blocked
10 completely. For this reason, the gateways 3 and 5 also comprise modems to handle such signals.

In the above situation, high load and even congestion in the IP network is likely to happen, since, for example,
15 the IP network capacity is not overdimensioned in great extent. This will be in particular a problem in case of a further application of the IP telephony in general.

In this situation, any delay caused by the congestion
20 should be minimised. Thus, there is no time for retransmissions of lost packets. Therefore, the UDP (User Datagram Protocol) is commonly used instead of TCP (Transmission Control Protocol). UDP is a rather simple protocol and has a minimum protocol handling. According
25 to this protocol, everything received from the application is sent via the network without any complicated checks. Furthermore, no check is performed whether all data packets have been received by the destination. Thus, this protocol provides a fast, but not
30 very safe transmission.

On the other hand, TCP includes a flow control mechanism. Therefore, this protocol is safer than UDP but requires more protocol handling and more time. This results in a

- 4 -

higher data amount required for the handling of the protocol.

In case of an overload or a congestion, UDP is not
5 capable to detect whether any failure in the transmission
have occurred. Moreover, in case of a congestion the
situation in the IP network is worsen by UDP since the
data packets are transferred via the network with a
constant rate.

10

In order to make the transmission safer when using UDP,
the receiving end can send back in its payloads the
information received, such that it can be checked whether
the data have been received safely. Alternatively, the
15 UDP could be provided with an acknowledge mechanism like
RTCP (Real Time Control Protocol) messages. However,
these possibilities both lead to a higher amount of data
to be sent via the network, which worsens the congestion
situation.

20

Thus, by using the conventional techniques, in case of an
overload and congestion of the network, the transmission
quality is decreased since packets are delayed or even
get lost.

25

SUMMARY OF THE INVENTION

Thus, the object underlying this invention resides in
30 removing the above drawbacks and to enable a sufficient
transmission quality even in case of congestion of a
network.

- 5 -

This object is solved by an interface establishing device for transmitting data to and receiving data from a network, comprising transceiver means being operable with variable transfer rates, a detecting means for detecting
5 the load upon said network, and a control means for adjusting the transfer rate of said transceiver means in response to the detected load.

Alternatively, the above object is achieved by a method
10 for transmitting data to and receiving data from a network, comprising the steps of detecting the load on said network, and adjusting a transfer rate of a transceiver means in response to said detected load.

15 Thus, it is possible to adapt the transfer rate of a modem or a codec in response to the load or congestion of a network.

That is, in the interface establishing device (gateway)
20 and method for transmitting data to and receiving data from a network according to the present invention, the transfer rate (data rate) can be adapted to the present load on the network. That is, in case a congestion occurs, the transfer rate can be set on a lower value
25 such that data packets can be safely transmitted via the network.

Thus, the transmission quality can be maintained on a sufficient level, since no packet delay or even losses
30 can occur. Only the bandwidth of the speech signal is slightly reduced due to the decreased transfer rate. That is, the speech quality might be reduced slightly, but the end-to-end link stays at least available.

Furthermore, by using the device and the method according to the present invention, it is possible for the IP network to recover faster from a congestion. This is
5 because the transfer rate, i.e., the data amount transmitted per time unit is reduced, such that the load on the network is decreased.

Further advantageous developments of the present
10 invention are stated in the enclosed dependent claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more readily understood
15 with reference to the accompanying drawings in which:

Fig. 1 shows the basic structure of the VoIP technique;

Fig. 2 shows a gateway according to an embodiment of the
20 present invention; and

Fig. 3 shows a process carried out in the gateway according to the embodiment of the invention.

25

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

The idea of the present invention is to use the congestion indication (or load indication), which is
30 available from the flow control information (e.g., for example from RCTP reports) to control the modem and/or codec transfer rate adaptively. That is, the transfer rate is controlled in such a manner that it is reduced in case a congestion is present and packets get lost and

- 7 -

that it is increased in case no congestion is present and all packets are safely received.

In the following, an embodiment of the invention is
5 described with reference to Figs. 2 and 3.

In Fig. 2, a gateway 3 according to the present embodiment is shown which can be used in the basic VoIP architecture illustrated in Fig. 1. As shown, the gateway
10 3 comprises a modem 31, a codec 33 and a flow controller 34.

The modem 31 serves to compress and decompress fax and/or modem signals TE_M which are transferred to the side of a
15 user terminal. The modem 31 is capable of transmitting with a plurality of different predetermined transfer rates (data rates). For example, the modem could provide transfer rates of 56 kbps, 33 kbps, 28 kbps and 9 kbps. The different rates can be selected by a modem control
20 signal CS_M. The output signal (IP_M) is transferred to the IP network 4 via a flow controller 34.

The codec 33 serves to compress and decompress speech signals TE_D which are transferred to the side of a user
25 terminal (in the configuration of Fig. 1, the phone 1). As the modem 31, the codec 33 is capable of transmitting with a plurality of different predetermined transfer rates (data rates). For example, the codec could provide transfer rates of 64 kbps, 32 kbps, 16 kbps, 8 kbps and 4
30 kbps. The different transfer rates can be selected by a codec control signal CS_C. The output signal (IP_C) is transferred to the IP network 4 via the flow controller 34.

The flow controller 34 serves basically to control the data stream sent to and received from the IP network 4. According to the present embodiment, the flow controller 5 34 also serves to detect the load on the network. The detection can be effected, for example, by using RTCP reports. For example, the (proprietary) RTP/TCP payloads can be used to transfer the number of transmitted/received packets between the gateways 3 and 10 5.

Furthermore, the load can be detected by monitoring Frame Relay's Forward/Backward Explicit Congestion Notification (FECN/BECN) bits, ATM (Asynchronous transfer mode) 15 reports etc.

Moreover, a test packet, for example, an IP PING packet can be sent via the IP network 4 to a predetermined destination, for example to the gateway 5, and then 20 received back from this destination. The occurred delay (round-trip delay) can then be analysed. By such an analysis, a delay can be measured. If this delay suddenly increases from an initially measured level, this indicates a congestion.

25 The flow controller 34 transmits corresponding detection signals to a mode/rate selector 32. According to this detection result, the mode/rate selector 32 sets (adjusts) the transfer rate of the modem 31 and the codec 30 33. For example, the mode/rate selector 32 sets the rate for the codec 33 according to the detected load on the network on 64 kbps PCM, GSM Full Rate (16 kbps) or GSM Half Rate (8kbps). On the other hand, in case of a modem

- 9 -

call this information can be used to adjust the maximum transfer rate of the modem 31.

Furthermore, this information can also serve to adjust the maximum transfer rate between a users modem (which can be arranged in the phone 1 according to Fig. 1, for example) and the modem 31 in the gateway 3 in range of 33,6 kbps, 28,8 kbps, 14,4 kbps and 9,6 kbps by commanding the modem 31. Hence, the amount of data coming from the user towards the IP network 4 can be controlled according to this embodiment.

Fig. 3 shows a flow chart in which a process according to the present embodiment is illustrated.

15

In step S1, the load on the IP network at present is detected. This information is used in step S2, in which the modem transfer rate for the modem 31 and the codec transfer rate for the codec 33 are selected. In step S3, the modem transfer rate determined in this manner is set in the modem 31. Furthermore, in step S4 the determined codec transfer rate is set in the codec 33.

Thus, the transfer rate of the modem 31 and/or the codec 33 (which are examples for a transceiver means) can be adapted to the load and the congestion on the IP network.

In the above described embodiment, the modem and the codec have been described as comprising a plurality of different, predetermined transfer rates. However, preferably the transfer rate can be freely (i.e., continuously) adjusted. The more modes (rates) in the modem/codec are, the smoother the transfer rates can be adapted to the load generated in the IP network. Thus,

- 10 -

preferably, a variable bit rate speech codec like an Adaptive Multi Rate (AMR) codec could be used for speech.

In the following, a second embodiment is described, which is a modification of the first embodiment. According to the first embodiment, fixed predetermined transfer rates are set in response to the detected load on the network for both the codec 33 and the modem 31 in the same way. However, it is possible that a lot of non-speech data like fax signals are transmitted via the modem. In this case, a high transmission quality in terms of speed is not as important as in speech signals, since a delay of data packets relating to a fax transmission only lengthens the time of transmission. In contrast thereto, delay of data packets relating to a speech transmission affect the speech quality greatly.

Thus, according to this embodiment, the transfer via the modem and via the codec are provided with different priorities. That is, in case of an overload or congestion of the IP network, the codec 31 gets a higher transfer rate since the codec mainly transfers speech signals. On the other hand, the modem 33 gets a lower transfer rate since the modem transfers also non-speech signals.

Moreover, as a further modification of the above described embodiments, it is also possible to simplify the detection performed by the flow controller 34. Namely, it can be assumed that the load on the IP network does not change abruptly. Thus, it can be sufficient to perform the detection only once in a predetermined period, for example, in every five minutes. For this, a timer can be inserted in the flow controller 34 which outputs an interrupt at the desired time point. In

- 11 -

response to this interrupt, the flow controller 34 performs the process as described with respect to Fig. 3.

Hence, the flow controller 34 does not always have to perform the detection and can be used for other operations.

The above description and accompanying drawings only illustrate the present invention by way of example. Thus, the embodiments of the invention may vary within the scope of the attached claims.

- 12 -

Claims:

1. An interface establishing device for transmitting data to and receiving data from a network (4), comprising
5 transceiver means (31, 33) being operable with variable transfer rates,
a detecting means (34) for detecting the load upon said network (4), and
a control means (32) for adjusting the transfer rate
10 of said transceiver means (31, 33) in response to the detected load.
2. The interface establishing device according to claim 1, wherein in said transceiver means (31, 33) comprise a
15 plurality of predetermined transfer rates and said control means (32) is adapted to select one of said predetermined transfer rates in response to said detected load.
- 20 3. The interface establishing device according to claim 1, wherein said transceiver means comprises a plurality of transceiver means (31, 33).
4. The interface establishing device according to claim
25 3, wherein said control means (32) is adapted to adjust for each of said transceiver means (31, 33) a different transfer rate.
5. The interface establishing device according to claim
30 3, wherein said control means (32) is adapted to provide each of said plurality of transceiver means (31, 33) with different priorities and to adjust a transfer rate of a transceiver means (33) with a higher priority on a higher

- 13 -

value than the transfer rate of a transceiver means (31) with a lower priority

6. The interface establishing device according to one of the previous claims, wherein said transceiver means comprises a modem (31) for modulating and demodulating of non-speech data (TE_M, IP_M).

7. The interface establishing device according to one of the previous claims, wherein said transceiver means comprises a codec (33) for encoding and decoding of speech data (TE_C, IP_C).

8. The interface establishing device according to claim 5, wherein said transceiver means comprises a modem (31) for modulating and demodulating of non-speech data (TE_M, IP_M) and a codec (33) for encoding and decoding of speech data (TE_C, IP_C), wherein said control means (32) adapted to provide said codec (33) with a higher priority and to adjust a higher transfer rate for the codec (33) than for the modem (31).

9. The interface establishing device according to one of the previous claims, wherein said control means (32) is adapted to send a test packet to a predetermined destination over said network (4), receive said test packet back from said predetermined destination and analyse the delay occurred in order to determine the load on said network.

10. A method for transmitting data to and receiving data from a network (4), comprising the steps of detecting (S1) the load on said network (4), and

- 14 -

adjusting (S2, S3, S4) a transfer rate of a transceiver means (31, 33) in response to said detected load.

- 5 11. The method according to claim 10, wherein in said transceiver means (31, 33) comprise a plurality of predetermined transfer rates and in said adjusting step (S2, S3, S4) one of said predetermined transfer rates is selected in response to said detected load.
- 10 12. The method according to claim 10 or 11, wherein said transceiver means comprises a plurality of transceiver means (31, 33), and in said adjusting step (S2, S3, S4) different transfer rates are set for each of said
- 15 transceiver means (31, 33).
13. The method according to claim 12, further comprising the steps of
- providing different priorities for each of said
- 20 plurality of transceiver means (31, 33) and
- adjusting a transfer rate of a transceiver means (33) with a higher priority on a higher value than the transfer rate of a transceiver means (31) with a lower priority.
- 25 14. The method according to one of the claims 10 to 13, wherein said transceiver means comprises a modem (31) for modulating and demodulating of non-speech data (TE_M, IP_M).
- 30 15. The method according to one of the claims 10 to 14, wherein said transceiver means comprises a codec (33) for encoding and decoding of speech data (TE_C, IP_C).

16. The method according to one of the claims 10 to 13, wherein said transceiver means comprises a modem (31) for modulating and demodulating of non-speech data (TE_M, 5 IP_M) and a codec (33) for encoding and decoding of speech data (TE_C, IP_C), further comprising the steps of providing said codec (33) with a higher priority and adjusting a transfer rate of the codec (33) on a higher value than the transfer rate of the modem (31).
- 10
17. The method according to one of the claims 10 to 16, further comprising the steps of
- 15 sending a test packet to a predetermined destination over said network (4);
- receiving said test packet back from said predetermined destination; and
- analysing the delay occurred in order to determine the load on said network.

1/2

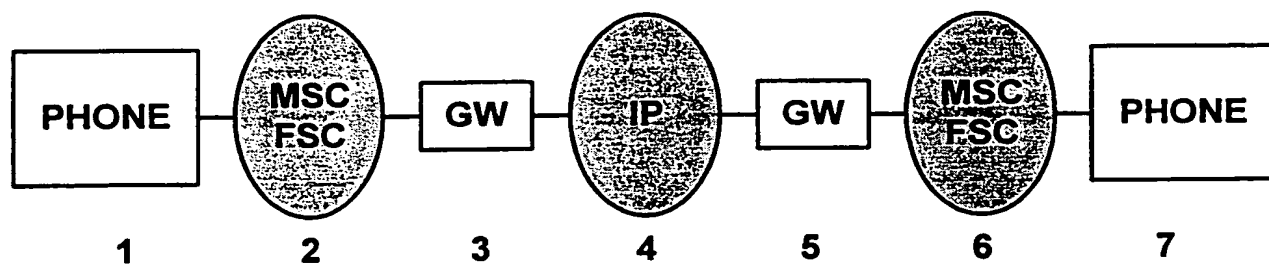


FIG. 1

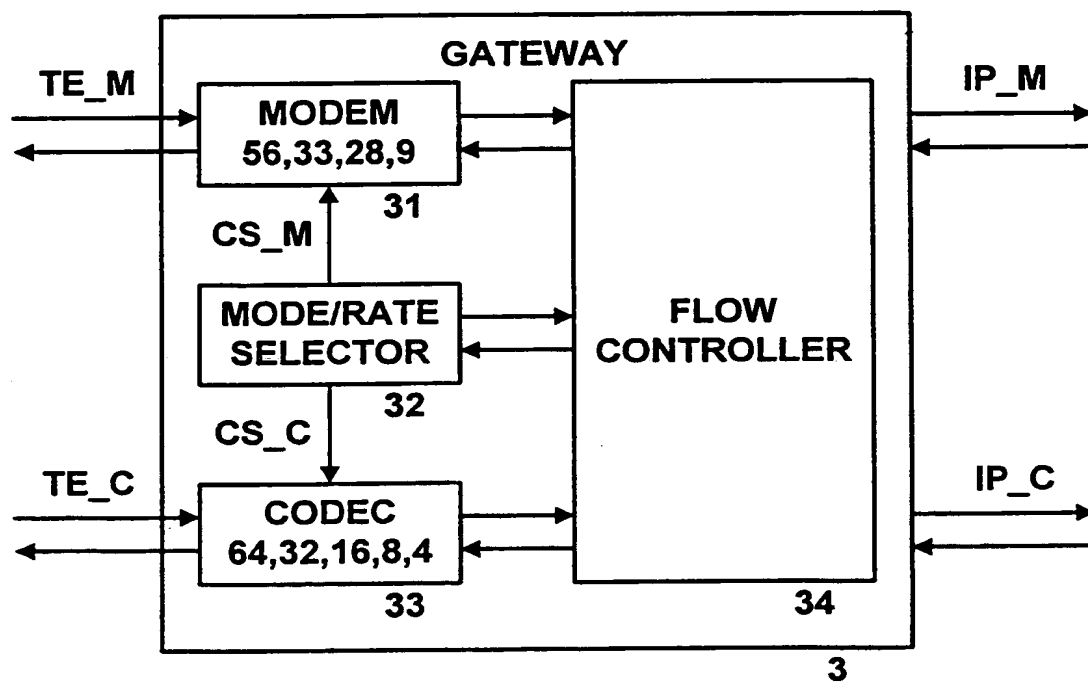
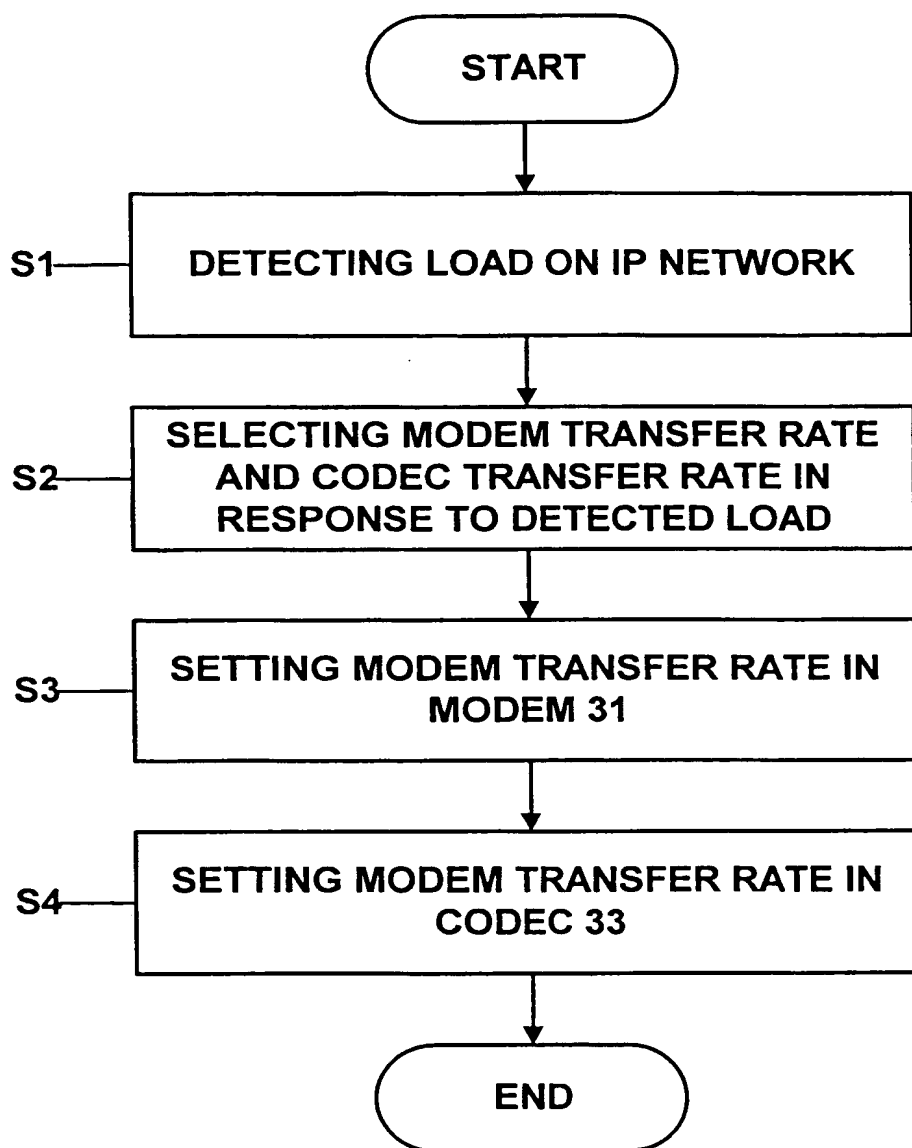


FIG. 2

**FIG. 3**

INTERNATIONAL SEARCH REPORT

International Application No
PCT/EP 99/03516

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q11/04 H04L12/56

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|---|-----------------------|
| X | EP 0 782 302 A (LUCENT TECHNOLOGIES INC) 2 July 1997 (1997-07-02) column 1, line 30-58 column 2, line 15 -column 3, line 5 column 5, line 44 -column 6, line 10 column 7, line 14-42 claims 1-3 | 1-4, 10-12 |
| Y | --- | 5,6,9, 13,14,17 |
| | -/-- | |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"O" document referring to an oral disclosure, use, exhibition or other means

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"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

Internal Application No
PCT/EP 99/03516

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|----------|--|-----------------------|
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